APPLICATION OF COOPERATIVE LEARNING TYPE THINK PAIR SHARE COMBINED MAKE A MATCH TO PRACTICE COMMUNICATION SKILLS ON ACID BASE MATERIALS

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Abstract. *The goals of this research to describe the application of cooperative learning model of Think Pairs Share combined Make a Match, student activities , communication skills, learning outcomes s , and student responses. The research design used was One Group Pretest-Posttest design with a sample of 36 students in class XI IPA 4 MAN Sidoarjo. The results showed that (1) Implementation model at three meetings in a row obtained a percentage of 89.58%; 89.58% and 95.83%. (2) Student activities at three meetings successively got a percentage of 97.96%; 95.56%; 96.11%. (3) Communication skills in the form of the quantity questions in three meetings with a percentage of 27.78%; 36.11% and 41.67% with quite good category, and the number of students' opinion in three meetings with a percentage of 36.11%; 55.56% and 72, 22%. Communication skills in the form of quality questions and opinions from students in three meetings with the number of students a good predicate of 3 and 12 students; 7 and 15 students; 6 and 19 students. (4) Student learning outcomes obtain an average score of 80.67, while the classical completeness of student learning outcomes is 88.89%. (5) Positive responses from students obtain an average per centage of 92.01 % . Overall the students' communication skills are in very good condition good criteria.*

Keywords: *Cooperative Type Think Pair Share, Make a Match, Communication Skills, Acid Base*

INTRODUCTION

Education is an effort to develop strength to acquire the intelligence, personality, and dexterity needed when interacting socially [1]. Education can also be expressed as a conversion process attitude and behavior in effort ripen themselves through the teaching and learning process [2].

The world of education is closely related to teaching methods. The teaching method is a communication process in conveying information using an intermediary or device that is specific to the information receiver [3]. Information and communication technology also has an important role in the pulse of current and future activities, including in the education element. The development of the information and communication technology sector as one of the changing products of the times offers new things for education [4].

Based on the results of the pre-research that was carried out at MAN Sidoarjo on October 25 2019 by interviewing chemistry teachers and distributing questionnaires to 35 students in class XII IPA 6 MAN Sidoarjo, stated that 8.57% of students often asked questions, 80% of students rarely asked questions, and 11.43% of students never asked questions, and 71.43% of students hesitated in asking questions or giving opinions in class. Based on the percentage of the results of the questionnaire obtained, it shows that students' communication skills are still low.

Chemistry is included in the scientific group that is studied at the secondary education level. Chemical materials at the secondary education level include acids and bases which study concepts and facts in their learning. Chemistry learning is often faced with a problem that requires a skill in solving it, one of which is communication skills. Students are trained in communication skills, namely by implementing a discussion model that allows students to develop their thinking and communicating skills [5]. This is in line with the statements of students in the pre-research questionnaire, that 85.71% of students stated that learning in groups makes it easier to understand the material, so these results indicate that the discussion method is the method that students prefer.

Interaction between students in groups or small groups for educational purposes can be very effective. Some common rules for student interaction in groups are as follows: 1) Group discussions (inside or outside the classroom); 2) Structured group activities (for example, role playing or games); 3) Group projects; 4) Peer tutors; and 5) Access to learning resources [6].

Learning model cooperative is one of the necessary models tried in framework increase Skills communication students, where student will work in group small which of course make they will Keep going interact and communicate. Member group in learning models cooperative formed in a manner heterogeneous [7]. Possible alternative strategies used in the implementation of cooperative learning model class to solving the problem above Think Pair Share.

Cooperative learning will produce optimal impact when combined with other learning models. Learning models Make a Match included in the range type cooperative learning. Make learning models a Match uses the procedure viz students find suits or pairs of cards with study something concept or to pic specific in happy situations. Every individual student with independent involved in a manner whole because every student required to find suit card suit [8].

During the course of participating in Think Pair Share cooperative learning combined with Make a Match , they will receive cards with detailed question cards (q-cards) for question cards and answer cards (a-cards) for answer cards, then think about the appropriate settings for each each card that has been obtained (Think) , then students find the settings of the cards (Make a Match) and combine them (Pair), after obtaining the appropriate card settings , students and their partners present the results of the suitability of the cards (Share). The selection of the Think Pair Share cooperative learning model is expected to be able to improve students' communication skills which are supported by better learning outcomes in acid-base materials, while combined with Make a Match can help students learn in a pleasant atmosphere. This is in line with the results of Widiastuti's research [9] which suggests that managing information and communication is made easier by implementing a combination of cooperative learning models, namely the Think Pair Share and Make a Match types in the learning process.

METHOD

Research type used in this study is descriptive quantitative, which aims to see the results of model implementation, activities, communication skills, complete learning outcomes, and student responses through the application of the Think Pair Share cooperative learning model combined with Make a Match. This research involved 36 students of class XI IPA 4 MAN Sidoarjo for the 2019/2020 academic year as research subjects. The design in this study is the One Group Pretest-Posttest Design.

The implementation of the learning model can be determined by using the formula:

% implementation of the learning model

$$= \frac{completed\ phase\ score}{\text{phase maximum score}} \text{x}100$$

The percentages obtained are classified in Table 1 below:

Table 1. Research Result Criteria

No	Percentage	Criteria
1	1%-20%	Very less
2	21%-40%	Less
3	41%-60%	Enough
4	61%-80%	Good
5	81%-100%	Very good

Table 1 shows that the implementation of the learning model will be said to be "good" and "very good" if the percentage is ≥61%.

activity is observed every 3 minutes during the teaching and learning process using student activity observation sheets with the formula:

% student activity

$$= \frac{\text{frequency of student activity that appears}}{\text{overall activity frequency}} \text{x } 100\%$$

The results of the percentage of student activity assessment obtained based on the formula are then interpreted as in Table 1. Students said active in a learning process if percentage activity _ _ student by ≥ 61%.

Students' communication skills are reviewed sheet based observation Skills communication observed by 6 observers . The

quantity of communication is not based on the total number of questions or opinions submitted by students, but is based on the total number of students who ask questions and submit opinions. The analysis was carried out thoroughly on each meeting use formula :
% quantity communication student

$$= \frac{\text{Number of students who communicated}}{\text{Total of students}} x100\%$$

Quality Communication includes quality of asking and quality of opinion. Quality ask student in accordance with Bloom's Taxonomy and quality students ' opinion is based on criteria _ argue in a manner logical and analytical that is logical and analytical.

% quality communication student

$$= \frac{\text{Number of score}}{\text{Total of score}} x100\%$$

Next, percentage from quality as well as quantity communication student interpreted in Table 2:

Table 2. Interpretation of students' communication skills

Percentage (%)	Criteria
0 – 33.3	Not good
33.4 – 66.6	Pretty good
66.7 – 100	Good

(Sudjana, 2011)

Learning outcomes are enabled to see student completeness after the implementation of the learning model cooperative type Think Pair Share combined with Make a Match on acid base material. Students are declared complete when they get a score of ≥ 75 (referring to the Minimum Completeness Criteria for MAN Sidoarjo). N-gain Score analysis (increase score) using the formula:

$$<g> = \frac{\text{Sposttest} - \text{Spretest}}{\text{Smax} - \text{Spretest}}$$

Gain score obtained interpreted to in category in accordance Table 3 :

Table 3 Criteria for evaluating the N-Gain Score

Score Gain	Category
>0.7	High
0.7 > g > 0.3	Medium
0.3	Low

Student response questionnaires are given after the learning process is complete which is used to determine student responses to learning activities using the formula:

$$\%P = \frac{F}{N} x\ 100\%$$

Information:

Q: student responses

F : the number of students who answered Yes

N : number of respondents

The percentage results are interpreted in Table 1.

RESULTS AND DISCUSSION

Implementation of the Learning Model

The implementation of the learning model observed by 2 observers with use sheet observations that have been provided . Learning activities are said to be carried out "well" if they have a percentage of ≥ 61%. The graph of the implementation of the learning model can be seen in Figure 1.

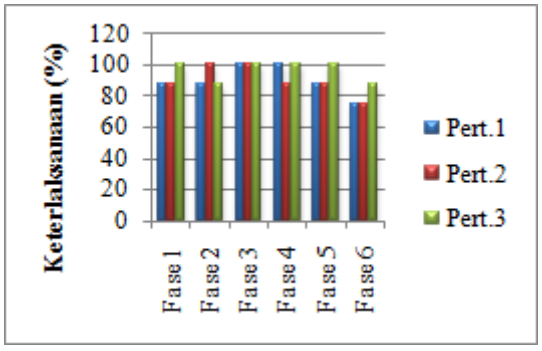

Figure 1 Implementation Diagram Model Learning

Figure 1 shows that the implementation of the learning model from the beginning to the end of the meeting was carried out or went "very well".

Phase 1 is conveying the goals and motivating teacher students through pictures of oranges and detergents as examples of acids and bases in everyday life . Percentage implementation results at the meeting I and II, namely 87.5% with the criteria of "very good", and at meeting III, namely 100% "very good". Percentage adherence in phase 1 ≥ 61%, so could stated that implementation in phase 1 was carried out very well. In phase 1 the teacher begins to practice skills communication to students both asking and

giving opinions through apperception activities and providing motivation.

Phase 2 is presenting information. In phase 2 there is a number of teacher activities include, giving explanation short about Theory sour language, as well arrange or designing class to implement discussion with learning models cooperative type think Pairs Combined shares with Make A Match. Students will get a q-card or a-card, then students who have get card given time to think in a manner independent (think) about appropriate card settings with card that was obtained. When the teacher gave a brief explanation of the acid-base material, there were several students who asked questions, so that other students could argue from the existence of these questions. Percentage implementation phase 2 in all three consecutive meetings namely 87.5% "very good"; 100% “very good”; and 87.5% "very good". Percentage adherence in phase 2 ≥ 61%, so could stated that implementation in phase 2 was carried out with “very good”.

Phase 3 is organizing students in learning teams. In this phase, the teacher guides students to find the setting of the card (Make a Match), then pair up (Pair) to discuss the compatibility of the cards . Students search for and find discussion partners from the cards they get. These activities train students' ability to think and interact with their classmates, which makes students participate actively during learning. Percentage implementation phase 3 in all three meetings consecutive i.e. 100 % ”very good”; 100% ”very good”; and 100% ”very good”. Percentage adherence in phase 3 ≥ 61%, so could stated that implementation in phase 3 is carried out with “very good” .

Phase 4 is guiding study and work groups. In phase 4, the teacher guides g student in a manner pair to present results discussion from to the suitability of the card obtained (Shares). Think Pair Share is effective for reducing the tendency of "free passengers", which means that this strategy is able to make students have a cognitively equal position, so that group participants are expected to be actively involved [10]. Percentage implementation phase 4 in all three consecutive meetings i.e. 100% ”very good”; 87.5% ”very good”; and 100% ”very good”. Percentage adherence in phase 4 ≥ 61%, so could stated that implementation in phase 4 was carried out with “very good”.

Phase 5 is evaluation. In this phase, students are also trained to ask questions and express opinions on the answers presented by the group of presenters. Percentage implementation phase 5 in all three consecutive meetings ie 87.5% ”very good”; 87.5% ”very good”; and 87.5% ”very good”. Percentage adherence in phase 5 ≥ 61%, so could stated that implementation in phase 5 is carried out with “very good”.

Phase 6 is giving awards. Students' comfort in learning and learning outcomes obtained increases along with the award given to groups or pairs that are active during the learning process [11]. Percentage implementation phase 6 in all three meetings consecutive namely 75% "good"; 75% "good"; and 87.5% "very good". Percentage adherence in phase 6 ≥ 61%, so could stated that implementation in phase 6 was carried out with "good".

Student Activity

Student actions in all forms of interaction with students and with teachers from the beginning to the end of learning are important student activities to pay attention to. Student activity was assessed through student activity observation sheets by 6 observers and observed every 3 minutes. Student activities at meetings I, II, and III can be seen in Tables 4 and 5 below:

Table 4 Percentage Activity Students at Meeting I

No	Activity Student	Percentage (%)
A	Student listen and pay attention teacher explanation	39.07
B	Student obtain card and think suit from card obtained (Think)	6.67
C	Student look for settings from card you have and match it (Pairs)	6.67
D	Student work on worksheets Step Pairs in a manner in pairs	9.81
E	Student with his partner explained results compatibility owned card (Shares)	9.81
F	Student submit questions to the teacher and the middle	9.81

No	Activity Student	Percentage (%)
	group put forward results the discussion	
G	Student refute or give opinion in the middle group put forward results the discussion	9.81
H	Student conclude Theory learning	6.30
I	Student To do activities such as playing cellphone, walking, chatting, etc.	2.04
Total		100

Table 5 Percentage Activity Students at Meetings II and III

No	Activity Student	Percentage (%)	
		II	III
A	Student listen and pay attention teacher explanation	18.70	15.56
B	Student work on worksheets independent (Think)	22.22	25.74
C	Student working on and discussing worksheets in pairs (Pairs)	12.59	12.96
D	Student together partner put forward results discussion (Shares)	15.93	16.29
E	Student submit questions to the teacher and the middle group put forward results the discussion	9.82	9.63
F	Student refute or give opinion in the middle group put forward results the discussion	9.82	9.63
G	Student conclude Theory learning	6.48	6.30
H	Student To do activities such as playing cellphone, walking, chatting, etc.	4.44	3.89
Total		100	100

Think stage students in the first meeting were different from the Think stage in the II and III meetings. The difference is because in meetings II and III students carry out experimental activities, so the Think stage is carried out students at meetings II and III, namely describing the results of the experiments that have been tried out. As for the Make a Match card at meetings II and III it is used as an intermediary for students to pair up at the Pair stage .

Student communication activity begins to be seen when students listen and pay attention to all information related to material and examples in everyday life, a number of students start asking questions and some others give opinions. The activity of students working on and discussing worksheets in pairs (Pairs) also makes students more active in communicating in small groups. Students feel no difficulty in mastering the material if in understanding the material they are actively involved in exchanging ideas in a smaller scope such as in groups [12].

Students at the Share stage with their partner present the results of their discussion. This activity can develop student cooperation, because at the time of presentation students will be mutually responsible for understanding the material and conveying the results of the discussion to their friends. The main goals of cooperative learning namely the creation of collaboration between students in expressing ideas or ideas in order to form an understanding [6] . The activities of students asking questions, arguing, and giving opinions are activities that are very influential in the process of training students' communication. Graph of student activity can be seen in Figure 2 below.

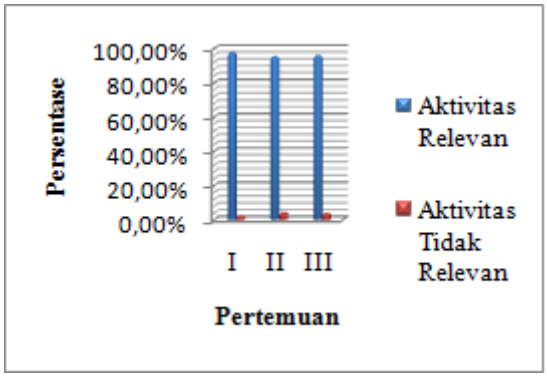

Figure 2 Percentage Chart Activity Student

All forms of student action whether relevant or irrelevant by students at meetings I, II, and III are illustrated in Figure 2. Relevant student activities such as listening to teacher explanations regarding acid-base material, asking and arguing about examples of acids and bases in everyday life, etc. get a percentage consecutively namely 97.96%; 95.56%; and 96.11%, p this show that learning

with a cooperative model type think Pairs Share combined with Make a Match make students not feel bored or bored during teaching and learning activities . This model is effectively used as a discussion, because the duration of time given to students is sufficient to exchange ideas and help each other.

Communication Skills

Skill data communication student obtained through observation use sheet observation Skills communication and observed by 6 observers. Observed skills covers Skills questions and skills argue. Observation this aim as gauge measuring success Skills trained communication _ to student through learning models cooperative _ type think Pairs Share combined with Make a Match on the material sour base During three meetings.

The quantity of communication is not based on the total number of questions or opinions submitted by students, but is based on the total number of students who ask questions and submit opinions. Students' communication skills are not only assessed based on the final grades obtained by students, the processes and changes that occur in students are also valued.

Vygotsky's theory of social constructivism suggests that social interaction with other people spurs the development of new ideas and enhances the intellectual development of learners [13]. Interaction with colleagues who have more abilities can be found when students carry out small group discussions with friends who are skilled in communicating, these students will be encouraged to learn to practice their communication skills with their partners, therefore the student process during the discussion process is also considered. The graph of the quantity of student communication can be seen in Figure 3.

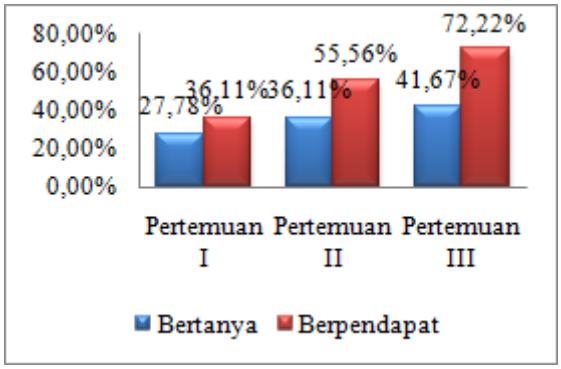

Figure 3 Communication Quantity Percentage Diagram

Based on picture _ 3 percentage quantity communication at meeting II is in the category “enough good” (33.4% – 66.6%), and at meeting III the quantity ask category “enough good”, meanwhile quantity opinion on category "good" (66.7% - 100%), so can be stated that students become more active in communicating during the learning process using a cooperative model type ThinkPair Share combined with Make A Match.

Quantity ask and think student for 3 meetings experience showing improvement _ that student already more Dare to ask and argue during the learning process. However, the percentage of the quantity asked was lower than the quantity of students' opinions. Therefore communication skills need to be trained for a long time in order to get satisfactory results [14].

Quality ask student will analyzed based on level ask Bloom 's Taxonomy of which it consists over 6 categories yes, C1 has arrived with C6. Quality ask student directly related to quantitative data ask students on each meeting.

Ask stated as something activities to communicate ideas and thoughts through a question, where a question becomes one indicator understand nope student in accept learning. The level of students' cognitive ability is reflected in the questions submitted [15]. data that obtained show progress of students in communicating at each meeting. In detail can be seen in Figure 4.

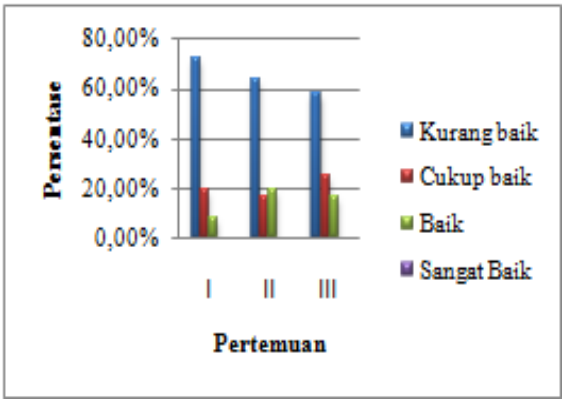

Figure 4 Percentage of Quality Asking Questions Diagram of Students

quality or quality of the questions asked by students is contained in Figure 4. At the first meeting the students received predicate not enough very dominating. Predicate "less good" decreased in meetings II and III, for the predicate "enough good" decreased in meeting II and increased in meeting III, for the predicate "good" increased at confluence II and decreased at meeting III.

Students at meeting I submitted level question Bloom 's Taxonomy C1-C3. Students at meeting II submit level question Bloom's Taxonomy C1-C4. Students at meeting III submitted level question Bloom's Taxonomy C1-C4.

Quality opinions submitted by students analyzed based on logical and analytical. Logical means opinion given supported by existing facts as well as support material presented and analytical means opinion put forward with clear and systematic in accordance rule good Indonesian. This condition makes students have begun to be trained and accustomed to communicating effectively. One's opinion skills can be measured by the effectiveness of the opinions conveyed. The effectiveness of opinions can be seen from the logic and analysis of students' opinions [16]. The graph of the quality of students' opinions can be seen in Figure 5.

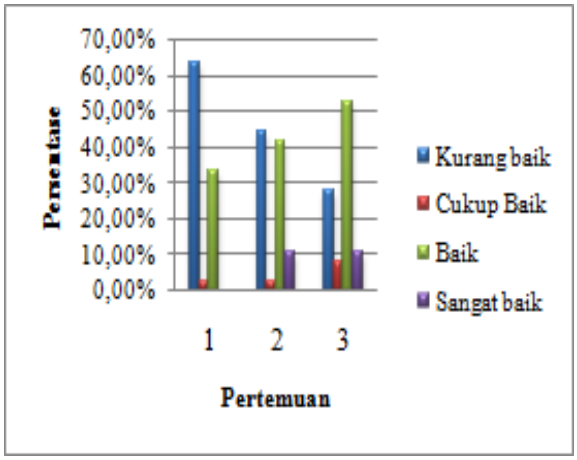

Figure 5 Percentage of Quality of Students' Opinion Diagram

Based on Figure 5 show that Skills argue student from first meeting, II, and III there was a significant increase. Students who get predicate "less good" is students who don't convey opinion during the learning process. Students who get predicate "enough good" is students who submit opinion only one time and opinions expressed only reach aspect analytical however no logical or logical however no analytical. Students who get predicate "good" is students who submit opinion only one time and opinions expressed reach aspect analytical and logical. Students who get the rating of "very good" is students who submit opinion at least twice and the opinion conveyed reach aspect analytical and logical.

Quality Skills communication is also supported by data on the implementation of the learning model in phases 1 yes now delivery of intent or purpose and delivery of motivation, phase 3, namely at stage Pair, phase 4 is at stage Share, and phase 5 ie evaluation. Teacher trains Skills communication in phases those who get very good category on each meeting. Execution phase show that student truly trained Skills communication using the learning model cooperative type think Pairs Share combined with Make a Match from the beginning to the end of the meeting. Activity student when discuss loaded questions in student worksheets with several other students and communicate results discussion the group to another group made quality communication student increase at each the meetin.

The predicates that students get are very varied, to make all students have the "good"

predicate requires frequent practice and practice. Teacher motivation is also an influential thing in the process of practicing communication skills. The correlation that is built between educators and students during learning greatly influences the effectiveness of communication. The teacher is in control of the class, therefore the implementation of positive, efficient and meaningful two-way communication is the responsibility of the teacher [17].

Student learning outcomes

pretest and posttest conducted at the beginning and at the end of the lesson will be used as measured learning outcome data use shaped device sheets of pretest and posttest questions regarding the sub- material sour language totaling 15 questions with form choice double.

The benchmark or standard of assessment is contained in the Minister of Education and Culture of the Republic of Indonesia no. 23 of 2016 which states that students in secondary education must fulfill several aspects, one of which is the knowledge aspect. This aspect of knowledge can be fulfilled by carrying out written tests in the form of pretest and posttest. Students are declared complete when a score of ≥ 75 is obtained (referring to the Minimum Completeness Criteria for MAN Sidoarjo) . Completeness of student learning outcomes in detail is presented in Figure 6.

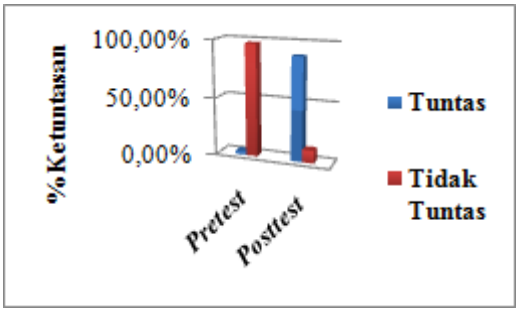

Figure 6 Mastery Learning Outcomes Student

The completeness of student learning outcomes is shown in Figure 6. The initial test (pretest) gets a percentage of 2.78%, which means that there is only 1 student from amount a total of 36 students class XI IPA 4 MAN Sidoarjo who achieved score completeness at the time pretest, while for posttest namely 88.89% which means as many as 32 students get score above KKM and has reach completeness, 4 other students have not reached completeness with a percentage of 11.11%. Next, the acquisition of student learning outcomes is analyzed using the Gain Score (increase score). Gain Score analysis is intended to see the level of efficiency of a model/method/treatment. Student Gain Score can be seen in Figure 7.

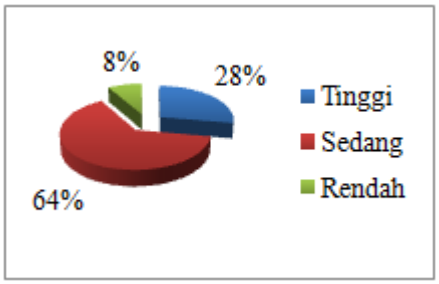

Figure 7 Gain Score Percentage Diagram

Based on Figure 7 student obtain enhancement results study i.e. "category". tall" by 28%, 64% for "category medium", and 8% for "category low". Implementation of learning models cooperative type think Pairs Share combined with Make a Match at meetings I, II, and III make student Becomes understand and understand about Theory sour base. As result score student increase after learning with posttest average result with 80.67 percentage completeness 88.89%. Improved learning outcomes are also supported by the existence of effective communication skills. Learning in the classroom is guaranteed to be successful if there is effective communication between educators and students [17].

Widiatusti [9] stated that the Think Pair Share cooperative learning model combined with Make a Match had a very rapid impact on student learning outcomes in chemistry learning. This is in line with the acquisition of the data obtained, it can be stated that changes in students' cognitive abilities increase with the application of the Think Pair Share cooperative learning model combined with Make a Match.

Student Response

The opinion poll questionnaire or questionnaire in this study was addressed to students, in order to find out the responses given by students to all teaching and learning activities from the beginning to the end of the meeting. Questionnaire response student form

descriptive question implementation of the learning model used, understanding student to material, as well Skills communication student. Student interest and interest in the learning process can be seen from student responses.

Student responses were very positive, as seen from the more dominant student responses that answered "Yes" which indicated that they gave approval and positive responses to the learning model that had been given. In the first statement, a percentage of 100% was obtained, which means that students stated that learning chemistry using this model gave rise to high enthusiasm for learning chemistry.

Students stated that the Think Pair Share model combined with Make a Match made students understand the material better with a percentage of 94.44%, also made students dare to ask questions and dare to express opinions with successive percentages of 86.11% and 88.89%. Cooperative learning of the Think Pair Share type combined with Make a Match is able to foster students' communication skills, so that learning becomes more active, and as many as 86.11% of students agree with this statement. Students also stated that this model made the material easy to remember and very useful for use in learning with successive percentages of 91.67% and 100%.

Student responses who answered positively to the implementation of the Think Pair Share type cooperative learning model combined with Make a Match to practice communication skills obtained an average percentage of 92.01% with the "very good" criterion.

CONCLUSION AND SUGGESTION

Conclusion

1. Execution models at meetings I and II 89.58%, and meeting III 95.83% with criteria “very good”.
2. Activity students at meeting I, II, and III respectively consecutive obtained percentage of 97.96%; 95.56%; 96.11% that shows student active during the learning process.
3. Skills form of communication quantity ask student in a manner consecutive there was an increase at the meeting I, II, and III with percentage by 27.78%; 36.11% and 41.67% with category “enough good”, and quantity argue student in a manner successively also experienced increase in meeting I, II, and III with percentage by 36.11%; 55.56% and 72.22%. Skills form of communication quality questions and opinions in a manner consecutive there was an increase in meetings I, II, and III with amount student predicated good by 3 and 12 students; 7 and 15 students; 6 and 19 students.
4. Study results student obtain score r e average of 80.67, meanwhile completeness classic results study student by 88.89%
5. Response positive student obtain average percentage of 92.01 % with criteria “very good”.

Suggestion

1. For chemistry teachers or future researchers who will apply the learning model cooperative type Think Pair Share combined with Make a Match You need to pay attention to the classrooms used so that students don't cluster together, and are able to manage the class well, because the class atmosphere will be a little noisy during the pairing stage .
2. For chemistry teachers or future researchers who will apply the learning model cooperative type Think Pair Share combined with Make a Match must be able to minimize irrelevant activities carried out by students.
3. For future researchers, it is hoped that they will examine the learning model more cooperative type Think Pair Share combined with Make a Match on other material that has characteristics suitable for this lesson.

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